Effects of crop evapotranspiration estimation techniques and weather parameters on rice crop water requirement

ABSTRACT

Accurate estimation of crop evapotranspiration is key to determination of crop water requirements as well as water productivity. In this study, Microflex-C sensors were mounted on three sets of lysimeter to measure crop evapotranspiration in the paddy fields of the Tanjung Karang Rice Irrigation Scheme. Evapotranspiration was obtained from water level recorded at 15 minutes interval for the entire irrigation season. The readings were carried out starting from middle of January to end of April 2012. Measured crop evapotranspiration were compared with estimated evapotranspiration from weather data using penman Monteith method. These evapotranspiration values were used to determine the actual crop water requirement of MR219 rice (Oryza sativa) variety. The lysimeter and weather data estimates showed that 37% and 48% of the total water supplied was enough to meet the actual crop water requirement. Sensor based Microflex-C readings from the lysimeter measurements reveals that less water was required to meet actual crop water requirement compared to estimated methods. The actual average daily crop evapotranspiration for the growing season were 4.1, 3.9 and 4.0 mm/day for the month of February, March and April, respectively. The average water productivity index was determined using the lysimeter reading and weather data were found to be 10.1kg/ha-mm and 7.8kg/ha-mm respectively.

Keyword: Evapotranspiration; Rice irrigation; Lysimeter; Crop coefficient; Microflex-C ultrasonic sensor; Telemetry